*Care and Operation of the*

# KEYSTONE MOVIE CAMERA

16-MILLIMETER

*for*

## Model A-7

*with either*

*f*.2.5 or *f*.1.5 Lens

Patented
U. S. Pat. Nos.
1722088
1841748
Other Pats. Pending

KEYSTONE MFG. COMPANY
BOSTON 24, MASS.

CONTENTS


| | PAGE |
|---|---|
| Preliminary Instructions | 3 |
| Table of Parts | 4 |
| Loading the Camera | 5 |
| Winding Camera and Footage Indicator | 10 |
| Operation of Camera | 11 |
| Audible Signal | 12 |
| For Computing Exposure with a Meter | 12 |
| Variable Speed Regulator | 14 |
| Length of Scenes | 15 |
| Focusing the *f*.1.5 Lens | 16 |
| Use of the Diaphragm | 17 |
| For Computing Exposure with a Meter | 19 |
| Panoramic Pictures | 19 |
| Film | 20 |
| Exposure Guide | 21 |
| Film Group | 22 |
| Depth of Field | 23 |
| Picture Area | 24 |
| Unloading the Camera | 25 |
| Use of Color Filters | 25 |
| Instructions for Using Telephoto Lens | 29 |
| Instructions for Using Wide Angle Lens | 31 |
| General Information for Making Good Pictures | 32 |
| Indoor Movies | 33 |
| Photoflood Lighting Suggestions | 35 |
| Care of the Camera | 35 |
| Lubrication | 37 |
| Titling | 38 |
| Splicing | 38 |
| Accessories for Keystone Cameras | 38 |
| Suggestions for Better Pictures | 39 |


# Preliminary Instructions

The Keystone Model A-7 Camera is regularly equipped with either the *f*.2.5 or the *f*.1.5 lens. The lenses for this camera are interchangeable. The *f*.2.5, *f*.1.5, *f*.2.7 wide angle lens or the *f*.4. Telephoto Lens can be used. Instructions for using and changing these lenses are on pages 16 and 29.

Upon first opening the camera, you will find a roll of leader inside. Practice threading the camera with this sample leader before attempting to take pictures.

We have found, upon investigation, that nearly all poor pictures taken by amateurs are directly responsible either to improper threading or to carelessness in changing the lens diaphragm for different light conditions. Therefore, in order to make good pictures at the very outset, read through the instructions of this manual and follow carefully the directions given. In this way, the maximum benefit and satisfaction will be derived from your Keystone Camera.

## TABLE OF PARTS

| PART | EXPLANATION |
|---|---|
| **1. Supply Spool Shaft** | Furnishes bearing for supply spool. |
| **2. Take-up Shaft** | Rotates the take-up spool. |
| **3. Supply Spool** | Holds the unexposed film. |
| **4. Take-up Spool** | Winds up the exposed film. |
| **5. Film Loops** **6.** | Shows size and shape of loop to be left when threading. |
| **7. Aperture Plate** | Film passes by aperture to be exposed. |
| **8. Film Gate Tension** | Holds film against aperture plate. |
| **9. Lens Hood** | Shields lens from sun. |
| **10. Diaphragm Ring** | Changes size of diaphragm opening. |
| **11. View Finder** **12. Sights** | Locates the subject and entire field which is being photographed. |
| **13. Upper Sprocket Guard** | Guides film over sprocket. |
| **16. Lower Sprocket Guard** | Guides film under sprocket. |
| **17. Sprocket** | Feeds film to and from film gate. |
| **18. Footage Register Lever** | Controls the footage register. |
| **19. Pull Down Claw** | Draws film intermittently past aperture. |
| **20. Winding Handle** | Winds spring motor (Fig. 4, page 8). |
| **21. Exposure Start Button** | Starts motor (Fig. 4, page 8). |
| **22. Exposure Lock Button** | Locks exposure button in place (Fig. 4. page 8). |
| **23. Footage Register** | Indicates how much film has been used (Fig. 4, page 8). |
| **24. Left Side Lock Button** | Locks door to camera (Fig. 2, page 6). |
| **25. Exposure Guide** | Shows correct exposure for different conditions (Fig. 4, page 8). |
| **26. Lens Plate** | Holds lens to camera (Fig. 4, page 8). |
| **27 Strap Handle** | Grip to hold camera steady. |
| **29. Variable Speed Regulator** | Sets speeds for film to pass thru camera. (Fig. 4, page 8). |



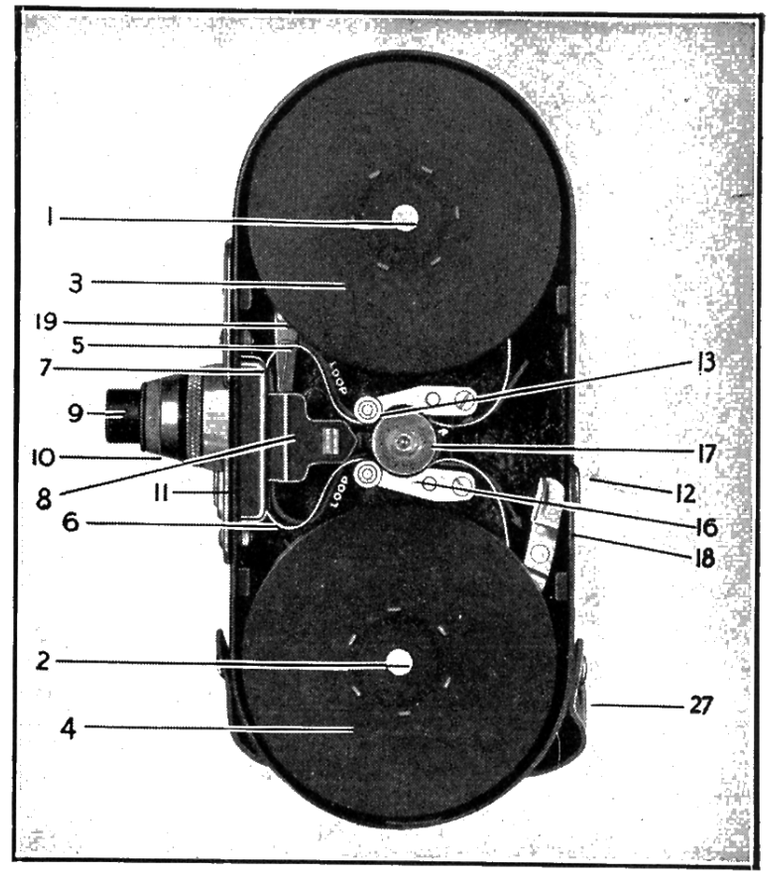



Fig. 1

# Loading the Camera

When loading and changing films, attention should be given to the following precautions. The film is guarded at each end by about four feet of film leader and trailer. It is this leader which makes daylight loading of the film possible, preventing light from entering during the operation.

It is recommended that loading and changing

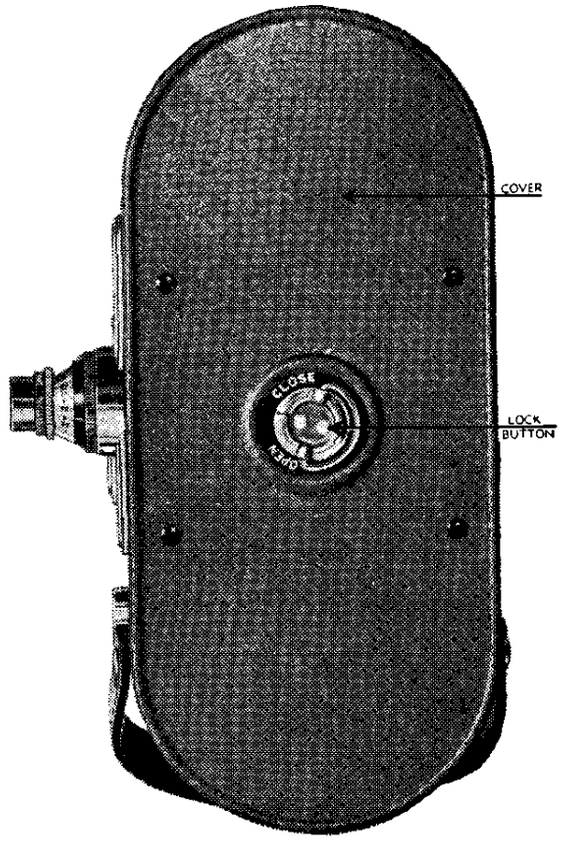



**Fig. 2**

be done with weak light and under no circumstances should the operation be performed in direct sunlight. If no shaded place is available when film is being loaded, work in shadow cast by placing your body between the sun and the camera.

Place camera on flat surface and open by turning lock button, Fig. 2, and lifting cover off camera. Compare the working parts on page 4 with those in the illustration in Fig. 1, and become thoroughly familiar with their names.



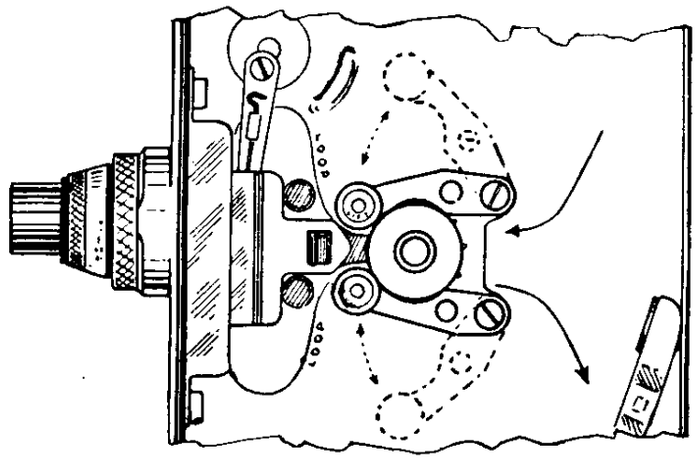


Fig. 3

Remove the roll of film from the carton in which it is supplied. All unexposed film is doubly safeguarded by a two-piece steel container. This not only protects the film from being accidentally exposed to light, but also protects the film from being damaged when it is returned to the processing station.

Remove the spool of film from the container in subdued light. Unroll about two feet from the spool, then place the spool on the upper spool shaft marked full reel. The spool should be so placed that the film feeds from the rear of the camera. Be sure that the spool is properly seated; the end of the shaft, Fig. 1, should project slightly, through the hole in the spool.

Lift the two knobs stamped "lift" on the upper and lower sprocket guards and swing the two arms outward as shown by dotted lines in Fig. 3. Then thread the film in the camera following the guide lines and arrows on the inside camera plate. *Be*

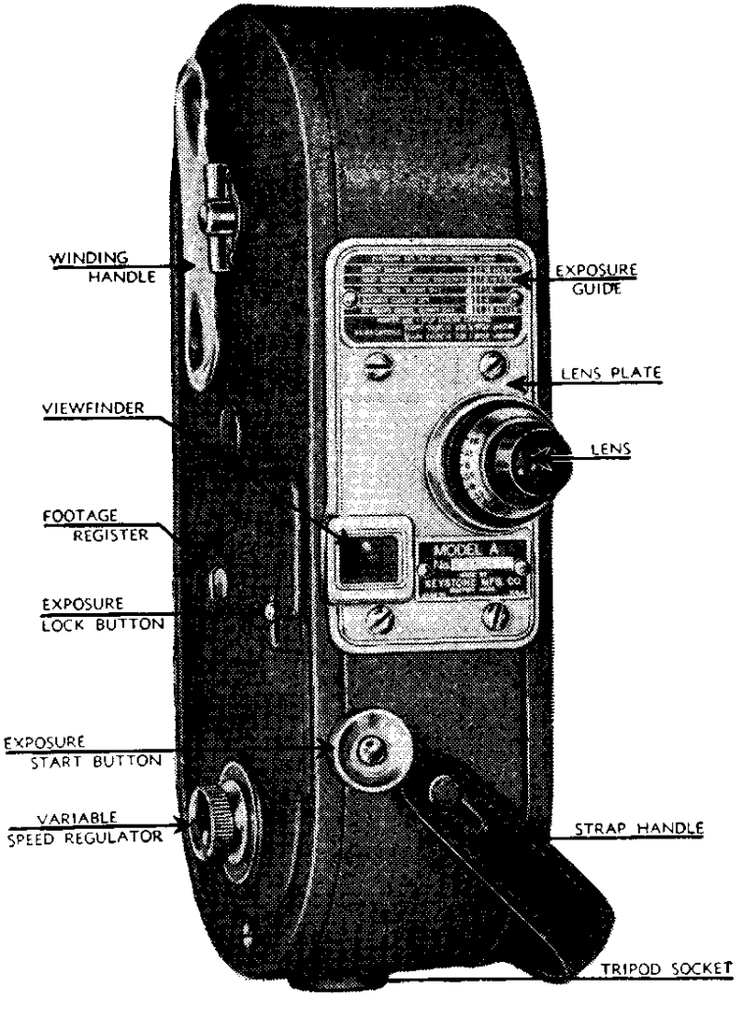



Fig. 4

*sure that the sprocket holes in the film are caught on the sprocket teeth.*

Close the upper sprocket guard, press back the film gate tension, form an upper loop as indicated by the lines on the camera plate, and insert the film in the aperture. Both edges of the film must be in



the channel of the aperture plate and the claw engaging the perforation of the film. Release the film gate tension. Form the lower film loop which is also indicated by the line, engage the film in the teeth on the lower side of the sprocket and close the lower sprocket guard. Be sure that the lifting knobs are locked in their slots. Pull the film loops gently to see that the film is caught on the claw in the aperture plate.

The guide lines in the camera indicate the proper upper and lower loops. A short loop may cause the pull down claw to jam the film.

Insert the free end of the leader in the take-up spool. Give the spool two or three turns clockwise to be sure that the leader is properly engaged. The take-up spool is put on or removed from the take-up shaft by pressing the footage register lever 18, Fig. 1. The take-up spool should always be of the kind with solid discs. Some spools have perforated discs but these do not keep out the light and are intended only for projecting the finished film. Under no circumstances use these spools in the camera. The take-up spools should be perfect in every respect. If the spool has been bent by dropping it or otherwise damaged, it is liable to cause the film to jam.

All spools must be straight and flat to operate properly in the camera. Spools with plates which have been counterbored to an excessive depth and also plates with holes which do not fit the shaft properly, are very liable to bind while the camera is in operation, causing the film to lose the loop or the camera to jam, ruining the film.

Run the mechanism for six or eight inches to be sure that the film has been properly threaded and is running smoothly. When assured that the film is running smoothly through the sprocket and film gate and that THE LOOP IS MAINTAINED, the cover is replaced and *locked*. The camera is now ready for action.

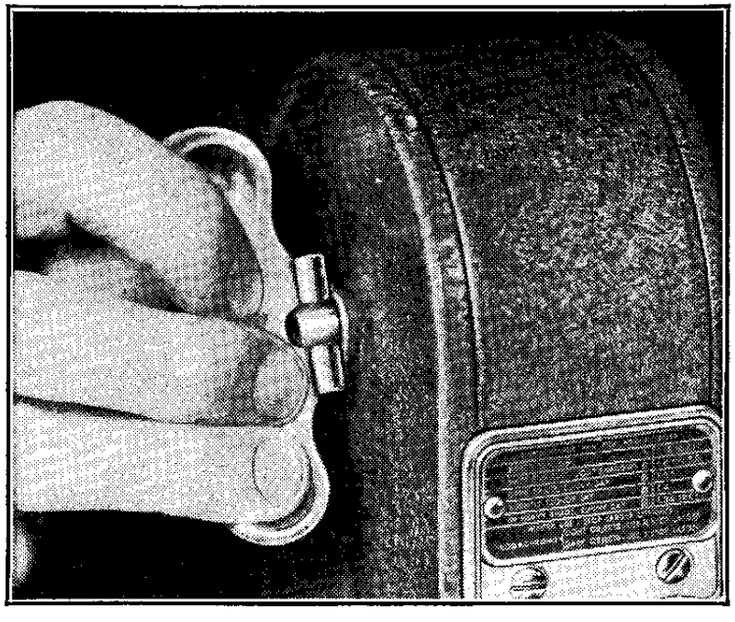


Fig. 5

## Winding the Camera
## The Footage Indicator

Turn the winding handle, Fig. 4, clockwise until the spring motor is entirely wound. Each full winding is sufficient to run off approximately twenty feet of film, but it is better to rewind the motor after every few shots. If the motor sounds



as if it were slowing down, stop it at once and rewind the spring.

The footage indicator, Fig. 4, automatically registers the number of feet of film that have been exposed. There is no adjustment of any kind necessary. When all the leader is used up the register will read zero, which means the film itself is now in the aperture and you are ready to shoot.

## Operation of Camera

Swing carrying strap 27, Fig. 1, to the cover side of camera and put the left hand between it and the camera, at the same time gripping the body of the camera firmly. Be sure not to cover the lens or front of finder with fingers. Place the camera firmly against the forehead with one eye looking through the rear finder lens. The picture will be the same as seen through the view finder, except on close-ups which require a slight correction as explained on page 13. Place a finger of the right hand on the exposure start button and brace both elbows against the body. In this way one is certain of getting steady pictures and is in control of the camera at all times.

The view finder is provided with a slide which drops down, obstructing the view when the camera is held upside down. When this is noticed, reverse the position of the camera.

To start the motor, press the exposure start button, Fig. 4, forward with a finger of the right hand. To stop the motor release the pressure. The camera may be locked in operating position so that the operator can get into the picture and camera run unattended. This is done by pressing the exposure

lock button forward and at the same time pressing the lock button, Fig. 4, upward which locks it in position; then step into the picture area. To stop the motor, step out of the picture area, return to the camera and push down the lock button. In this service the camera must be mounted on a tripod.

When the camera is empty and not in use, avoid unnecessary tension on the spring by letting the motor run down.

The lens must be screwed tightly into the lens holder to be in proper focus. Loose lens will cause picture to be blurred or out of focus.

## Audible Signal

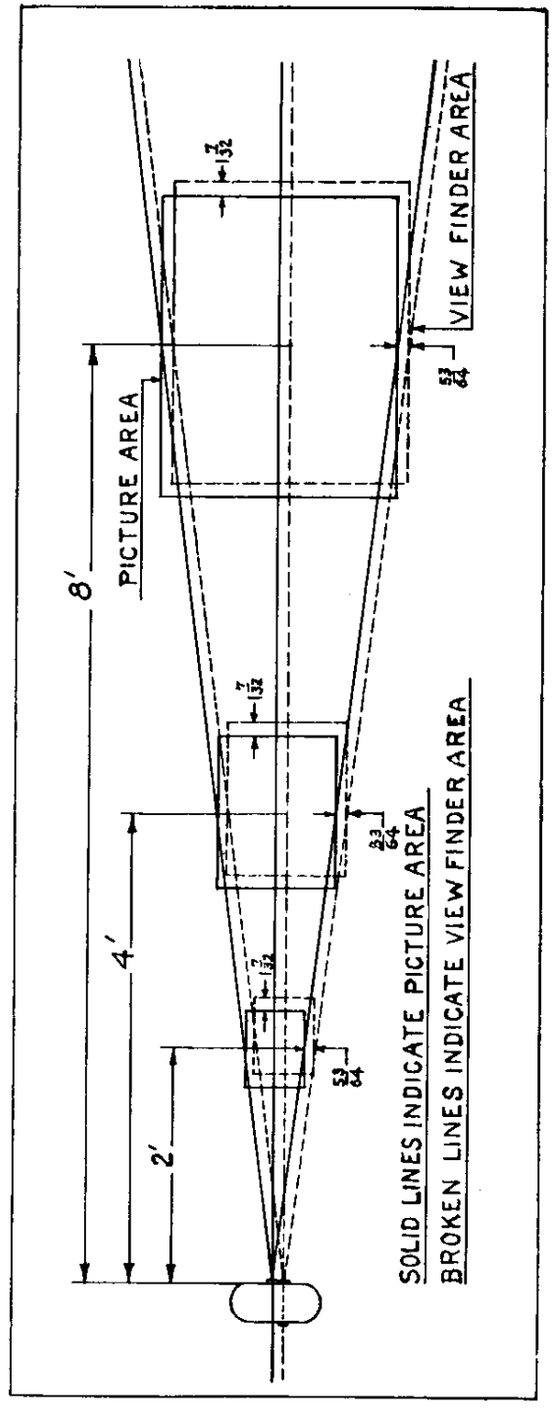
A very useful and patented feature of the new Keystone camera is the audible film register with which it is equipped. Each time about one and one-half feet of film becomes used a soft signal rings and reminds the operator to shoot the proper film footage for the scene. This precludes the necessity of stopping the camera to see how much film has been used on the scene.

## For Computing Exposure with a Meter

The angle of opening in the shutter is 160°. The length of exposure for the various speeds is approximately

| | | | |
|---|---|---|---|
| for | 10 | frames | 1/22 second |
| | 16 | | 1/36 |
| | 24 | | 1/54 |
| | 32 | | 1/72 |
| | 40 | | 1/90 |
| | 48 | | 1/108 |
| | 64 | | 1/144 |

**Diagram showing the correction required for accurate viewing of picture on close ups.**




The view seen through the view finder is slightly different from the picture taken on the film due to the difference in the location of the view finder and the camera lens. This difference is shown in the above diagram.

At distances less than 10 feet the correction shown in the diagram should be made if an accurate view is required. As the distance increases, the difference becomes small when compared to the size of the field and may be disregarded.

## Variable Speed Regulator

The Keystone A-7 camera is equipped with a variable speed regulator, Fig. 4, so that it may be operated at seven different speeds for various purposes. These speeds are marked as "Low," "Normal," four "Intermediate" speeds, and "Slow Motion." Each of these speeds has a particular use as described in the following paragraphs.

1. "Normal." At this speed the film runs through the camera at 16 frames per second. All exposure guides are calibrated for this speed. In practically all cases the camera should be set at "Normal" as this results in the most economical use of film consistent with steady, flickerless projection.

2. "Low." Use this adjustment (a) when light is very poor, (b) when film is running low and it is desired to use it as economically as possible, (c) when comedy effects of speed-up motion is desired.

At this adjustment the film runs through the camera at 10 frames per second. This results in longer exposure so that the lens diaphragm should be set at one-half stop smaller than normal. (See page 17 for setting lens diaphragm.) However, action becomes correspondingly speeded up on projection. The "Low" adjustment should be used only when necessary, and the subjects cautioned to move slowly and deliberately. It is very important to hold the camera steadily, or jerky pictures will result.

3. "Intermediate." There are four adjustments under this marking with speeds of approximately 24, 32, 40, and 48 frames per second. These speeds vary, where accurate work is required a test should be made first. Use the first three speeds for slowing down very rapid action, and the 48 frames per second for a semi-slow motion. Open the lens diaphragm from one to one and a half stops larger than normal when using intermediate speeds.



4. "Slow Motion." This speed is extremely useful in slowing down action and, therefore, finds its greatest value in analyzing motion, such as a golfer's stroke, a tennis serve, or a runner's form. It may also be used to advantage in producing comedy effects.

At "slow motion" the film runs through the camera at 64 frames per second or four times the normal speed. For this reason the lens diaphragm should always be opened two stops larger than normal. The camera should not be run without film at high speed.

## Length of Scenes

Some beginners make the mistake of using too much film in taking one scene. This is both uneconomical and unnecessary, for when the film is projected, the picture becomes tiresome before the scene changes. The other extreme is also to be avoided, for cutting a scene too short also gives an undesirable effect; the scenes flash on and off the screen before the eyes of the audience can grasp the image.

For any continuous action or scene that doesn't change its nature, for instance, close-ups of people, scenics, a water fall, etc., experience has shown that about five feet of film is sufficient. If action is

changing, more than five feet may be required to tell the story. Start the camera just before the action, and stop just after the action.

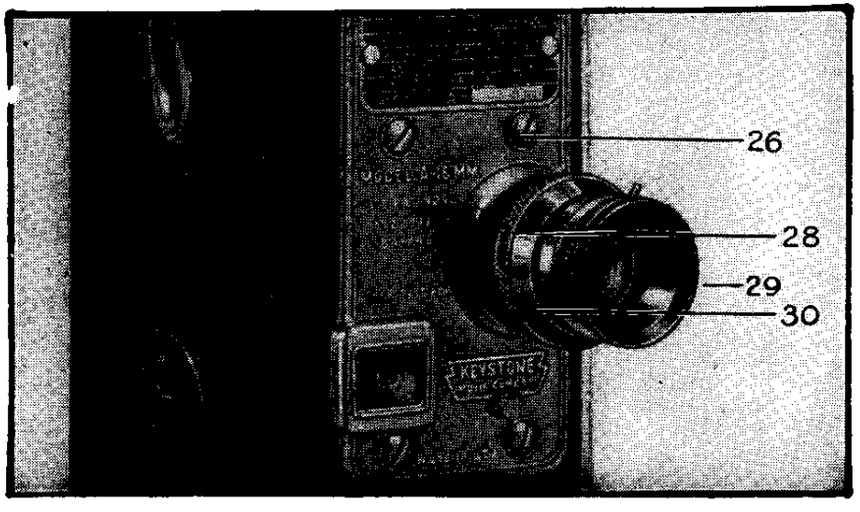



Fig. 7

## Focusing the *f*.1.5 Lens

When using the *f*.1.5 lens, accurate focusing is very necessary in the making of good pictures. The focusing scale on the *f*.1.5 lens barrel is engraved for 2, 3, 4, 6, 8, 12, 18, 25 feet and INF. (Infinity—which can be understood to mean any distance over twenty-five feet.) To set the focus the collar 28, Fig. 7, on the lens barrel must be turned until the figure that agrees nearest to the estimated distance from the camera to the subject is at the line on the lens barrel. When conditions warrant using the diaphragm stop *f*.5.6, *f*.8., *f*.11. or *f*.16., the distance can be set at eighteen feet and all objects beyond the following distances, for each lens stop, will be in focus



| F.5.6 | F.8 | F.11 | F.16 |
|---|---|---|---|
| 5½ | 4 | 3 | 2½ |

The location seen through the view finder for close-ups will differ slightly from the picture taken by the lens. See page 13.

## Use of the Diaphragm

Probably the most important factor in producing motion pictures is correct exposure.

Distant scenes which appear clear in the view-finder are often blurred on the film, due to haze. This can be corrected by using a yellow filter with black and white film and a haze filter with Kodachrome. In order to increase the depth of field in views over 50 feet away when using a universal focus lens, it is recommended that stops of *f*.8 and smaller be used.

On the Keystone Model A-7 Camera, exposures are governed by the diaphragm located between the two lenses which compose the lens system shown in Fig. 8. This is a device which controls the amount of light passing through the lens by either increasing or decreasing the size of the opening through which light may pass. This is operated by turning the diaphragm ring on which are stamped the diaphragm stop number.

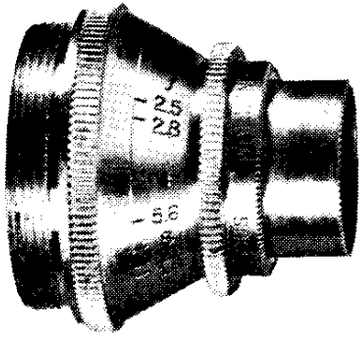
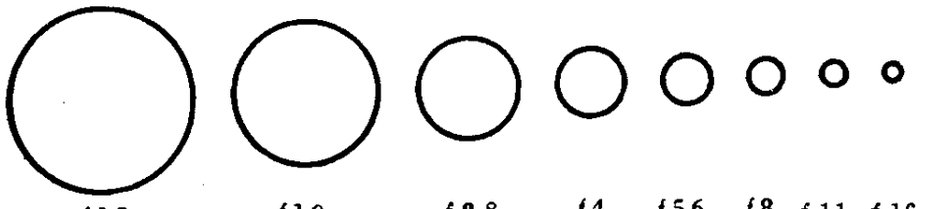



Fig. 8

By the "diaphragm stop" we mean the actual size of the aperture in the diaphragm through which light may pass and reach the film.




The term *f*.1.5 signifies the largest diaphragm opening, *f*.1.9 is slightly smaller than *f*.1.5. *f*.2.8 is smaller than *f*.1.9, and so on to *f*.16., which is the smallest diaphragm opening. The term *f*.2.8 indicates the largest opening of the *f*.2.8 lens. *The higher the number the smaller the opening.* The size of the opening to use depends upon the quantity of light on the subject — the more light the smaller the opening; the less light the larger the opening. To change the size of the diaphragm opening, turn the diaphragm ring until the number stamped on it, corresponding to the required opening, comes opposite the gauge mark on the base of the lens. Each consecutive larger diaphragm opening gives approximately twice as much exposure as the preceding opening.

The exposure guide on the front of the camera and the exposure chart on page 21, are given as guides to correct exposure under various conditions



for use with either *f*.3.5, *f*.2.5 or *f*.1.5 lens. Any exposure larger than *f*.3.5 refers only to lens which have those stops.

It will be well to acquire the habit of inspecting the diaphragm stop before taking each scene. In this way one never forgets to change the diaphragm stop for different exposure conditions.

The *f*.2.5 lens on this camera is known as a universal focus lens, the mount requiring no adjustment for distance. With each diaphragm opening we would recommend that the object be no closer than the following distance.

| Diaphragm | *f*.2.5 | *f*.2.8 | *f*.4 | *f*.5.6 | *f*.8 | *f*.11 |
|---|---|---|---|---|---|---|
| Distance | 8½ ft. | 7½ ft. | 6½ ft. | 5 ft. | 4 ft. | 3 ft. |

## Panoramic Pictures

Panoraming is taking pictures while swinging the body around. The camera is in operation while being moved through an arc, thus obtaining a panoramic scene. This generally results in a jumpy picture due to the uneven and unsteady motion of the camera while in operation. This practice is not recommended and should ony be attempted by one thoroughly experienced in using a motion picture camera. Panoraming in any case should be done by moving camera very slowly.

# FILM

Orthochromatic film is a general outdoor film, which produces pictures in black and white. It is very sensitive to violet and blue colors.

Panchromatic film requires less light to make the exposure. It is more sensitive to red, green, orange, and yellow, than orthochromatic and can be used with a wide range of filters.

Supersensitive panchromatic film is generally used when the lighting is poor or for indoor work, as it requires less light than panchromatic to make an exposure. It is sensitive to the same colors as panchromatic.

Kodachrome film reproduces pictures in their natural colors. The regular daylight kodachrome is used for outdoor work. When used indoors with a tungsten light a special blue filter is required to obtain the correct color. Type A Kodachrome is for use indoors with tungsten light. When used outdoors a special orange filter should be used to obtain the correct color.



## Outdoor Exposure Guide for the Keystone Cameras

16 mm. with shutter speed of 1/36 second at 16 frames per second. See next page for film group

| LIGHT CONDITIONS | | Kodachrome | Film Group Black & White Film I | II | III | IV |
|---|---|---|---|---|---|---|
| Bright sun | Sea - sky - snow | *f*.11 | *f*.11 | *f*.16 | *f*.16 with 2X Filter | *f*.16 with 4X Filter |
| Bright sun | Average subject scenes not in shade | *f*.8 | *f*.8 | *f*.11 | *f*.16 | *f*.16 with 2X Filter |
| Bright sun | Scenes partly in the shade | *f*.5.6 | *f*.5.6 | *f*.8 | *f*.11 | *f*.16 |
| Sun behind light clouds | Scenes not in the shade | | | | | |
| Bright sun | Scenes in the shade | *f*.5.6 to *f*.3.5 | *f*.5.6 to *f*.3.5 | *f*.5.6 to *f*.4 | *f*.8 | *f*.11 |
| Sun behind light clouds | Scenes partly in the shade | | | | | |
| Hazy sun | Scenes not in the shade | | | | | |
| Sun behind light clouds | Scenes in the shade | *f*.3.5 to *f*.2.5 | *f*.3.5 to *f*.2.5 | *f*.3.5 | *f*.5.6 | *f*.8 |
| Hazy sun | Scenes partly in the shade | | | | | |
| Dull day | Scenes not in the shade | | | | | |
| Hazy sun | Scenes in the shade | *f*.1.9 to *f*.1.5 | *f*.1.9 to *f*.1.5 | *f*.2.5 to *f*.1.9 | *f*.3.5 | *f*.5.6 |
| Dull day | Scenes partly in the shade | | | | | |
| Dull day | Scenes in the shade | Not recommended | | *f*.1.5 | *f*.2.5 | *f*.3.5 |

These stops are for use from 3 hours after sunrise to 3 hours before sunset. Use a larger opening at other times.
At 10-12 frames per second use ½ stop smaller opening. At 48 frames per second use 1½ stops larger opening. At 64 frames per second use 2 stops larger opening.
Stops given for Kodachrome are basic exposures. Consult chart enclosed in film package for further details.

# FILM-GROUP CLASSIFICATION

## FOR USING EXPOSURE CHART ON PRECEDING PAGE

The following films are grouped according to their speed rating. The exposure required for each group will vary with the light conditions. The American Standards Association rating, called "exposure index number" defines the inherent sensitivity of the film emulsion and will soon be in general use. Weston & General Electric Ratings are also shown.

| | | Keystone Film Group | A.S.A. Exposure Index Number Daylight | Tungsten | Weston Rating Daylight | Tungsten | G. E. Rating Daylight | Tungsten |
|---|---|---|---|---|---|---|---|---|
| | **16 MM Film** | | | | | | | |
| ANSCO | Triple "S" Pan | IV | 100 | 64 | 100 | 64 | 125 | 100 |
| | Hypan | III | 32 | 25 | 32 | 24 | 48 | 32 |
| | Color Daylight Type | | 10 | — | 10 | — | 16 | — |
| | Color Tungsten Type | | — | 12 | — | 10 | — | 16 |
| KODAK | Cine-Kodak Super XX | IV | 100 | 80 | 80 | 64 | 125 | 100 |
| | Cine-Kodak Super X | III | 40 | 32 | 32 | 24 | 50 | 40 |
| | Cine-Kodak Pan Negative | III | 32 | 20 | 24 | 16 | 40 | 24 |
| | Cine-Kodak Super XX Negative | IV | 125 | 80 | 100 | 64 | 160 | 100 |
| | Kodachrome Daylight Type | | 10 | 4* | 8 | 3* | 12 | 5* |
| | Kodachrome Type A | | 10‡ | 12 | 8‡ | 12 | 12‡ | 20 |

*With Color Film filter for photoflood.

‡With Type A Color Film filter for daylight.

For indoor exposures see chart on Page 36 showing lamps required at various distances.

# DEPTH OF FIELD TABLE

## FOR USE WITH 1" CAMERA LENS FITTED WITH FOCUSING MOUNT

This table shows the distance in front of and behind the point of focus that is sharply defined.

The hyperfocal distances are the nearest point in sharp focus when distance is focused upon. If the lens is focused on the hyperfocal distance the depth will then extend from a point one half of the hyperfocal to infinity.

All distances are in feet.

| Distance focused on | DIAPHRAGM APERTURES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *f*.1.5 | *f*.1.9 | *f*.2.8 | *f*.3.5 | *f*.4 | *f*.4.5 | *f*.6.3 | *f*.8 | *f*.11.3 |
| 2 feet | 1.8- 2.1 | 1.8- 2.2 | 1.7- 2.3 | 1.6- 2.3 | 1.6- 2.4 | 1.6- 2.5 | 1.5- 2.8 | 1.4- 3.2 | 1.1- 4.3 |
| 3 feet | 2.9- 3.3 | 2.6- 3.4 | 2.3- 3.7 | 2.3- 4. | 2.3- 4.2 | 2.2- 4.4 | 2. - 5.5 | 1.9- 7.1 | 1.6-Inf. |
| 4 feet | 3.4- 4.6 | 3.3- 4.8 | 3.1- 5.4 | 2.5- 6. | 2.8- 6.5 | 2.8- 7.1 | 2.4-10.4 | 2.2-17.3 | 1.9-Inf. |
| 6 feet | 4.9- 7.6 | 4.7- 8.2 | 4.2-10. | 3.9-12.1 | 3.8-14.1 | 3.6-16.9 | 3.1-78. | 2.7-Inf. | 2.2-Inf. |
| 8 feet | 6.2- 11.2 | 5.8- 12.6 | 5.2-17.2 | 4.7-24.4 | 4.5-34.6 | 4.2-57.2 | 3.5-Inf. | 3.1-Inf. | 2.5-Inf. |
| 12 feet | 8.4- 21.1 | 7.7- 26.5 | 6.6-61.6 | 5.9-Inf. | 5.5-Inf. | 5.2-Inf. | 4.2-Inf. | 3.6-Inf. | 2.8-Inf. |
| 15 feet | 10.9- 51.4 | 9.8-101. | 8.1-Inf. | 7.5-Inf. | 6.5-Inf. | 6.1-Inf. | 4.7-Inf. | 4. -Inf. | 3. -Inf. |
| 25 feet | 13.1-256. | 11.6-Inf. | 9.3-Inf. | 8. -Inf. | 7.3-Inf. | 6.8-Inf. | 5.1-Inf. | 4.3-Inf. | 3.3-Inf. |
| **Hyperfocal Distance** | **27.7** | **21.9** | **14.9** | **11.9** | **10.4** | **9.3** | **6.5** | **5.2** | **3.7** |

*f*.3.5 and *f*.2.5 lenses are set for an object in focus at 18 feet distance

## APPROXIMATE SIZE OF FIELD OBTAINED WITH A KEYSTONE CAMERA 16-M.M. — USING 1″ FOCUS LENS

| Distance from Camera in Feet | SIZE OF VIEW | |
|---|---|---|
| | VERTICAL Angle 16°-9′ | HORIZONTAL Angle 21°-22′ |
| 2 feet with focusing mount or with portrait attachment on fixed focus mount. | 0′7″ | 0′9″ |
| 3 feet with focusing mount or with portrait attachment on fixed focus mount. | 0′9″ | 1′0″ |
| 4 Feet | 1′2″ | 1′7″ |
| 6 Feet | 1′8″ | 2′4″ |
| 8 Feet | 2′4″ | 3′1″ |
| 15 Feet | 4′4″ | 5′11″ |
| 25 Feet | 7′2″ | 9′8″ |
| 50 Feet | 14′6″ | 19′6″ |
| 75 Feet | 21′8″ | 29′4″ |
| 100 Feet | 28′11″ | 39′1″ |
| 200 Feet | 57′11″ | 78′2″ |
| 500 Feet | 144′10″ | 195′7″ |



## Unloading the Camera

When the register disc indicates that all the film has been used, continue to run the camera until you are sure the end of the film is all wound on the lower spool so as to prevent the film from being light struck when removing it from the camera. With a little experience one can tell the moment the last of the trailer passes through the film gate and on to the take-up reel.

Open the camera in subdued light and remove the spool of film as quickly as possible placing it in its original container.

Replace the reel which originally contained the unexposed film on the take-up spindle. This will serve as the take-up reel for the next film. Keeping it in the camera will protect it from being bent or mislaid.

Place the metal case containing the exposed roll of film in the cardboard container and print your name and address plainly in the spaces provided for them. All the cartons contain the name and address of the manufacturer to whom it is to be returned for processing. Do not seal the carton unless you wish to pay first class postage rates on it. The purchase price of the film also includes the cost of processing and return postage.

## Use of Color Filters

Scenes which often contain a color combination that is very pleasing to the eye become pictures registered in black and white or shades of black and white when photographed. The colors lose

their distinction, two different colors may appear in the picture to be just one block or shape with no difference in tone or shade, lacking any detail. Black and violet will be shown as black, green and blue will be registered as a dark grey; yellow and orange as a light grey; white appearing in its true color. Much of the value of the picture will be lost due to the lack of contrast between the colors.

With the use of the proper filters, colors which would appear in the picture as the same shade will be reproduced in different tones, changing what might be a dull monotone photograph into one full of contrast giving the picture much of its original color value.

The effects of the filter on each color must be understood before selecting the one to be used. Observe closely the colors which are to be photographed, then choose the filter which will be most effective in giving contrast to the picture. In a scene where foliage predominates a green filter is required to give contrast to the foliage. A scene of dark colors such as black, purple and dark red, requires a red filter to lighten up these colors and give sufficient contrast to the picture so that each color can be readily distinguished.

The filters most generally used to give contrast are yellow, red and green, the following table shows the shades in which each color is rendered when using panchromatic film.

A haze filter is often used with Kodachrome film to clear up haze which very often appears when taking distance scenes or scenes in high altitudes.



| SUBJECT COLOR | FILTER COLORS | | |
|---|---|---|---|
| | GREEN | YELLOW | RED |
| | Shades rendered by the film | | |
| black | black | black | black |
| violet | dark grey | very dark grey | black |
| blue | grey | dark grey | very dark grey |
| green | very light grey | grey | dark grey |
| yellow | light grey | very light grey | grey |
| orange | grey | light grey | light grey |
| red | dark grey | dark grey | very light grey |

A neutral density filter is used when photographing under extremely bright lighting conditions, to cut down the exposure.

The exposure required to form an image on the film depends upon the amount of light passing through the diaphragm, it is necessary to open the diaphragm enough to compensate for the light retarded by the filter. Each diaphragm stop approximately doubles the exposure. By adjusting the diaphragm the correct exposure may be obtained when using a filter with ordinary lighting conditions.

The amount of light absorbed by a filter depends upon the color being photographed and the light source. Various films have different degrees of color sensitiveness. The exposure depends upon the intensity and type of light source and the color sensitivity of the film. It is, therefore, impossible to give a filter factor which can be applied to all conditions, and any value given would only be an approximate guide.

In general one-stop larger opening may be used for 2x Filters and two stops larger opening for 4x Filters.

A yellow filter is the only one recommended for use with orthochromatic film.

The general practice is to have the filter as close to the lens as possible. Hoods which can be unscrewed from the lens should be removed and the filter screwed into place, the hood can be replaced on to the filter. The hood on a *f*.1.5 lens is not removable. To remove the hood on other lens grip the front end with the rubber cap on and turn counter clockwise.

A few of the uses which can be made of a filter to improve the quality of your pictures are given.

## Yellow Filter

Penetrates haze, fog and mist.

Reduces glare from the sun on sand or water and gives better detail.

Improves detail in shaded structures, such as archways, doorways, stairs, etc.

Gives detail in scenes where creamy or yellow tone predominates.

## Red Filter

Cuts out blue and violet haze, fog and mist, and glare of sun on the water.

Improves detail in dark colors, purple, dark red, and deep shadows, also snow scenes, tan or shaded faces. Darkens the sky with good details of clouds and gives a lighter foreground. Over exposing will lighten the sky.



## Light Yellow Green Filter

Improves the detail of foliage on any green scenes and reduces the halo caused by reflected green light. Darkens scenes of red, yellow and blue. Gives a dark sky.

## Color Film Filter

Daylight Color Film Filter is used with daylight film and Tungsten light.

Type A Color Film Filter is used with Type A film and sunlight.

Color Film Haze Filter is used to penetrate haze and light mist.

## Instructions for Using the Telephoto Lens

A telephoto lens on your movie camera gives the effect that a telescope does to the human eye. It magnifies, brings in the distance and permits close-ups to be made of nearby or far off objects.

The Keystone *f*.4. Telephoto Lens has a three-inch focal length, and since a telephoto lens magnifies the equivalent of its focal length, this lens magnifies objects three times larger than would the regular one-inch lens. In this way it records on the film distant objects that would appear practically indistinguishable were they made with a lens of short focus. The advantage is therefore obvious. It makes possible the photography of timid and wild animals, birds and other creatures from a distance in their natural haunts. In making movies of surgical operations, it eliminates the necessity of working too close to the subject. In races, games and

other outdoor sports, the favorite can be photographed to appear in larger proportions when projected on the screen.

The Telephoto Lens is interchangeable with the *f*.2.5 or *f*.1.5 lens. Merely unscrew the lens on the camera from the aluminum lens plate and replace with the telephoto lens. Be sure to screw it up tight. After the lens is securely fastened to the camera, the indicator controlling the diaphragm and distance setting can be placed at the most convenient position for reading by simply turning the front lens hood to the right using a little force.

When using the Telephoto Lens, very accurate focusing for distance is necessary. This is especially true at the shorter distance. The focusing

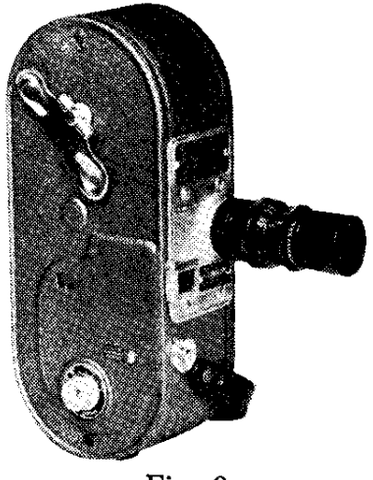


Fig. 9

scale on the Telephoto Lens is engraved for 3, 4, 5, 6, 7, 8, 10, 15, 20, 30, 50 feet, and INF. (Infinity—which in this case can be understood to mean any distance over fifty feet.) To set the focus, the collar on the lens barrel must be turned until the figure



that agrees nearest to the distance from the camera to the subject is at the line on the lens barrel.

For exposures with the Telephoto Lens, the chart on Page 21 can be used. The diaphragm stop *f*.22. should be used whenever photographing objects in the open sky or sea, e.g., airplanes, distant boats, birds, etc. Use of a color filter is also recommended for this type picture.

The general practice is to remove the hood and screw the filter in front of the lens, the hood can be replaced in front of the filter.

While making exposures with three-inch Telephoto Lens, the camera must be absolutely steady. The slightest tremor of the camera is emphasized into damaging proportions by the vast magnification of the lens. Therefore, use of a tripod is highly recommended for all telephoto work.

The location seen through the view finder for close-ups will differ slightly from the picture taken by the lens. See page 13.

## Instructions for Using the Wide Angle Lens

The 17 mm. focus *f*.2.7. wide angle lens gives an angle of view approximately 53% wider than is obtained with a one-inch lens. This lens is recommended for use in confined spaces for obtaining a larger area.

The wide angle lens is interchangeable with the *f*.3.5. lens. Merely unscrew the lens on the camera and replace it with the other lens. Be sure to screw it up tight.

The adjustment of the diaphragm of the fixed focus mount is the same as the *f*.2.7. The micrometer or adjustable mount requires the same setting for distance as the *f*.1.5. lens.

The view finder is designed for a one-inch lens. When using a wide angle lens we suggest centering the scene in the view finder, allowing the picture to extend beyond the edge shown in the view finder.

## General Information for Making Good Pictures

Before replacing the camera cover, always test for correctness of threading by first running through a foot or so of film.

It will be your tendency at first to direct your movie camera at posed subjects. This type of picture should be left for the still camera, for a movie camera is primarily an instrument for recording action. Your first pictures will probably be of family and friends. The best scenes will very likely be those made when the subjects are not conscious of being filmed, or when you can get them so preoccupied with a bit of action that they forget all about the camera.

Plan your pictures to tell a little story of some kind. In amateur motion pictures the story element is achieved by adding a planned bit of action which turns what otherwise might be a dull and uninteresting film into one that is vivid and interesting. For instance, your little girl holding her doll will make an attractive picture but there will be no story element in it. Show her giving her pet doll a birthday party, tucking napkins under rag necks, pouring



tea and perhaps asking grace before starting the meal and you will have a story picture.

The most effective pictures are those in which not more than one-third of the picture area consists of sky, sea or very light foreground.

Always hold the camera in a vertical position. It can be pointed at an upward or downward angle but should not be tipped sideways.

Never allow the sun to shine directly into the lens. When it is necessary to shoot against the sun, have your lens well shielded from the direct light of the sun — either by its own sunshade or the shadow of some convenient tree or other object. Expose for the shadows in this type of picture.

Although each winding of the motor is sufficient to run off approximately twenty feet of film, it is best to wind after each scene or two.

Be careful to follow the exposure guide on the front of the camera before taking each scene.

The hood of the *f*.2.5 lens should be removed before attaching a color filter or portrait attachment.

When making a distant view the best effects are obtained by having some nearby object in the foreground.

## Indoor Movies

Home Movies can be made at night with your Keystone Camera. It is only necessary to have sufficient light. This can be obtained with the Mazda Photo Flood Lamps and the Keystone Reflectors.

Light from one source will cause heavy shadows which tend to spoil the picture. It is better to ar-

range the lights so that the rays come from different angles—this breaks up the shadows giving clear detail to the picture. In most scenes some light should



Fig. 10

fall in the back, or, a light colored screen may be used at the rear to brighten up the back. It should be quite close to the object.

Window shades should be drawn down to prevent reflection from the glass. All bright reflections from glass doors, picture frames or glossy surfaces should be eliminated. The lamps and stands should be so located that they will not show in the picture. Cloth or parchment shades have very little reflecting power; when used with photoflood lamps see that they are placed far enough away to withstand the excess heat given off by these lamps.

The lens stop to use depends upon the distance from the lamp to the object and not the location of the camera, except, we suggest that the minimum distance for each stop be maintained, as shown in the bottom line of the chart on page 36.



One No. 2 Photoflood Lamp may be substituted for two No. 1 Photoflood Lamps when referring to the chart, assuming that each is mounted in its proper reflector.

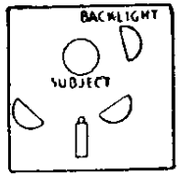
Regular Photoflood Lamps are for use with Type A Kodachrome film when used indoors.

Daylight Photoflood Lamps are for use with Regular Kodachrome film when used indoors.

Either lamp may be used with black and white film. The Daylight Photoflood Lamp should give the best results.

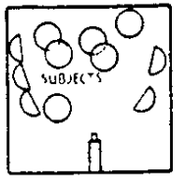
## Photoflood Lighting Suggestions

### CLOSE-UP WITH BACKLIGHTING




Relatively more light is needed for close-ups, because a small lens opening should be used to get subject sharp. Refer to diagram, noting that backlight should be above or below head, and to one side. Do not count backlight in determining exposure.

### LONG SHOT WITH NORMAL LIGHTING




This is an example of employing extra lamps to the side and back for the purpose of outlining all subjects with light, thereby giving greater depth to the scene. Be sure primary source contains correct number of lamps for distance and exposure as tables specify.

## Care of the Camera

When not in use the Camera should be kept either in a carrying case or the carton in which it came. *It should be kept free from dust and dirt.*

**The following table gives the necessary information for use with a Keystone Movie Camera when using photoflood lights with a Keystone light units for indoor work.**

| Number of #1 Photoflood Lamps in Proper Reflectors | FILM See Page 22 for Film Group | DISTANCE BETWEEN OBJECT AND LAMPS IN FEET — SIZE OF LENS OPENING | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | F 8 | F 5.6 | F 4.5 | F 3.5 | F 2.5 | F 1.9 | F 1.5 |
| One lamp | Kodachrome A | | | | | 3½′ | 4½′ | 7′ |
| | Kodachrome Regular with filter | | | | | | | 3′ |
| | Group III | | | 3′ | 3½′ | 5′ | 7′ | 9′ |
| | Group IV | | 3½′ | 5′ | 6′ | 9′ | 12′ | 15′ |
| Two lamps | Kodachrome A | | | | 3½′ | 4½′ | 7′ | 9′ |
| | Kodachrome Regular with filter | | | | | | 3½′ | 4½′ |
| | Group III | | | 4′ | 6½′ | 7′ | 11′ | 14′ |
| | Group IV | 4′ | 6′ | 7½′ | 10′ | 13′ | 17′ | 21′ |
| Three lamps | Kodachrome A | | 3′ | 3½′ | 4′ | 6′ | 8½′ | 11′ |
| | Kodachrome Regular with filter | | | | | 3′ | 4′ | 5′ |
| | Group III | 3′ | 4′ | 5′ | 7′ | 9′ | 12½′ | 16′ |
| | Group IV | 4½′ | 7½′ | 9′ | 12′ | 15′ | 21′ | 27′ |
| Four lamps | Kodachrome A | | 3½′ | 4′ | 4½′ | 7′ | 10½′ | 13½′ |
| | Kodachrome Regular with filter | | | | | 3½′ | 4½′ | 6½′ |
| | Group III | 3½′ | 5′ | 6½′ | 8½′ | 11′ | 14′ | 18′ |
| | Group IV | 6′ | 8½′ | 11′ | 14½′ | 18′ | 25′ | 32′ |
| Minimum distance at which a Universal focus lens should be used without portrait attachment. | | 4′ | 5′ | 6½′ | 7½′ | 8½′ | | |



The lens should be cleaned whenever necessary. A dirty lens causes cloudy pictures which lack brilliance and sharp focus on the screen. Wind some sort of lintless cloth around a match stick and rub the front of the lens gently, taking care that you do not scratch it by too much pressure. Do not moisten the cloth in any way. Occasional cleaning of outer surface of front and rear lenses of the view finder will insure a clear vision at all times.

The film gate tension and aperture plate should be regularly cleaned after each roll or two of film. Dirt or small pieces of emulsion sticking to the aperture plate will cause the film to become scratched and create a rain-effect on the screen. To clean the aperture and film gate tension, take a small strip of chamois or similar material about the same width as a piece of film and slide it into the film gate as though it were film. Then draw it back and forth two or three times to remove any foreign particles that might be there.

When the camera is empty and not in use, avoid unnecessary tension on the spring by letting the motor run down.

## Lubrication

The bearings in the Keystone Camera are made of a special composition that should not require lubrication under normal usage more than about once a year. Since the mechanism of the camera consists of gears and shafts practically like a clock, it is necessary to remove the mechanism from the case in order to do a good lubricating job. We recommend that the camera be returned to the factory about once a year for cleaning and lubricating.

## Titling

You can have your films titled by your movie camera dealer for small cost or you can purchase a titling outfit and do this work yourself. Titling adds continuity and interest to the picture and makes the sudden change from one scene to another less abrupt.

## Splicing

General practice is to splice your 100-ft. lengths of 16 mm. film together, making one 400-ft. reel, which the average projector is equipped to carry. You can purchase splicing equipment from your dealer or you can have this work done by him for a small charge.

## Accessories for Keystone Cameras

The Keystone Camera is so designed, that, as the amateur progresses, he may add accessory equipment for achieving more advanced results in photography and so increase the versatility of his original equipment. The telephoto lens and the *f*.1.5 speed lens are instantly interchangeable with the standard *f*.2.5 lens. Other useful accessories available are: Potrait attachments for getting sharp close-ups, color filters for special effects, tripods, editing outfits, and many others. Write to the Keystone Mfg. Co., Boston, Mass., for the special Camera Accessories Catalogue.



## Suggestions for Better Pictures

Poor results are generally due to the following causes, for which we suggest possible corrections. Plan the scene before taking the picture, select a suitable background and see that the lighting is fairly uniform.

FILM LIGHT STRUCK appears as light flashes on the film, CAUSED by rays of sun light striking the film. CORRECTION, do not allow direct light to fall on the film when loading the camera, see that the cover of the camera fits tight and that the lens is not pointed toward the sun when taking the picture.

If spool sides are even slightly bent, light will enter between side of disks and film, causing film to become light struck throughout section of complete film.

CAMERA JAMMING and will not run, CAUSED by film not winding up on the take-up reel, and piling up inside the case. CORRECTION, check the empty reel before using, see that the flanges are not bent and that the space between the flanges is wide enough for the film to enter. Also, make sure film is properly attached to hub of reel.

UNDER EXPOSED pictures are too dark and the shadows lack details, this is CAUSED by insufficient light falling on the film. CORRECTION, the lens opening recommended on the exposure guide should

be used, a smaller opening gives underexposure. The lens cap must be off when the exposure is made.

OVER EXPOSED pictures are too light and the highlights lack details, this is CAUSED by too much light falling on the film. CORRECTION, the lens opening recommended on the exposure guide should be used, a larger opening gives over exposure. The spring motor must not be allowed to run down completely when exposure is being made.

UNSTEADY OR TILTED pictures are not pleasing to look at, they are CAUSED by the camera not being held steady and level when the picture is taken. CORRECTION, hold the camera firm and steady, stand still, and check the image in the view finder to see that the camera is level.

OUT OF FOCUS pictures are blurred and not sharp, this is CAUSED by the lens not being properly fitted or set. CORRECTION, the lens should be screwed in tight, focusing lens must be set to the correct distance from the object. Universal lens should not be used at distances closer than those recommended for various diaphragm openings—and distant shots with Universal Focus Lenses—will not be sharp with openings larger than F.8. Panoraming is not recommended and should only be done by one thoroughly experienced in using a camera.

FILM SCRATCHES are perpendicular lines running through the picture, CAUSED by an accumulation of emulsion or dirt in the film gate. CORREC-



TION, clean the film gate before threading a new roll of film. Projector film gate should also be cleaned before running film through it.

LOSS OF LOOP results in a double image or badly blurred picture, this is CAUSED by the film being pulled through continuously by the sprocket rather than fed through intermittently by the feed finger. CORRECTION, film should be properly fitted over the sprocket teeth, inserted correctly in the film gate after the upper and lower loop is formed, and checked to see that the finger engages and moves the film, before putting on the cover.


## KEYSTONE CARRYING CASE



This Carrying Case can be used for any of the Keystone Cameras. It is fabricated of genuine leather. Equipped with straps that are adjustable, the case can be carried either in the hand or on the shoulder.

APRIL, 1947